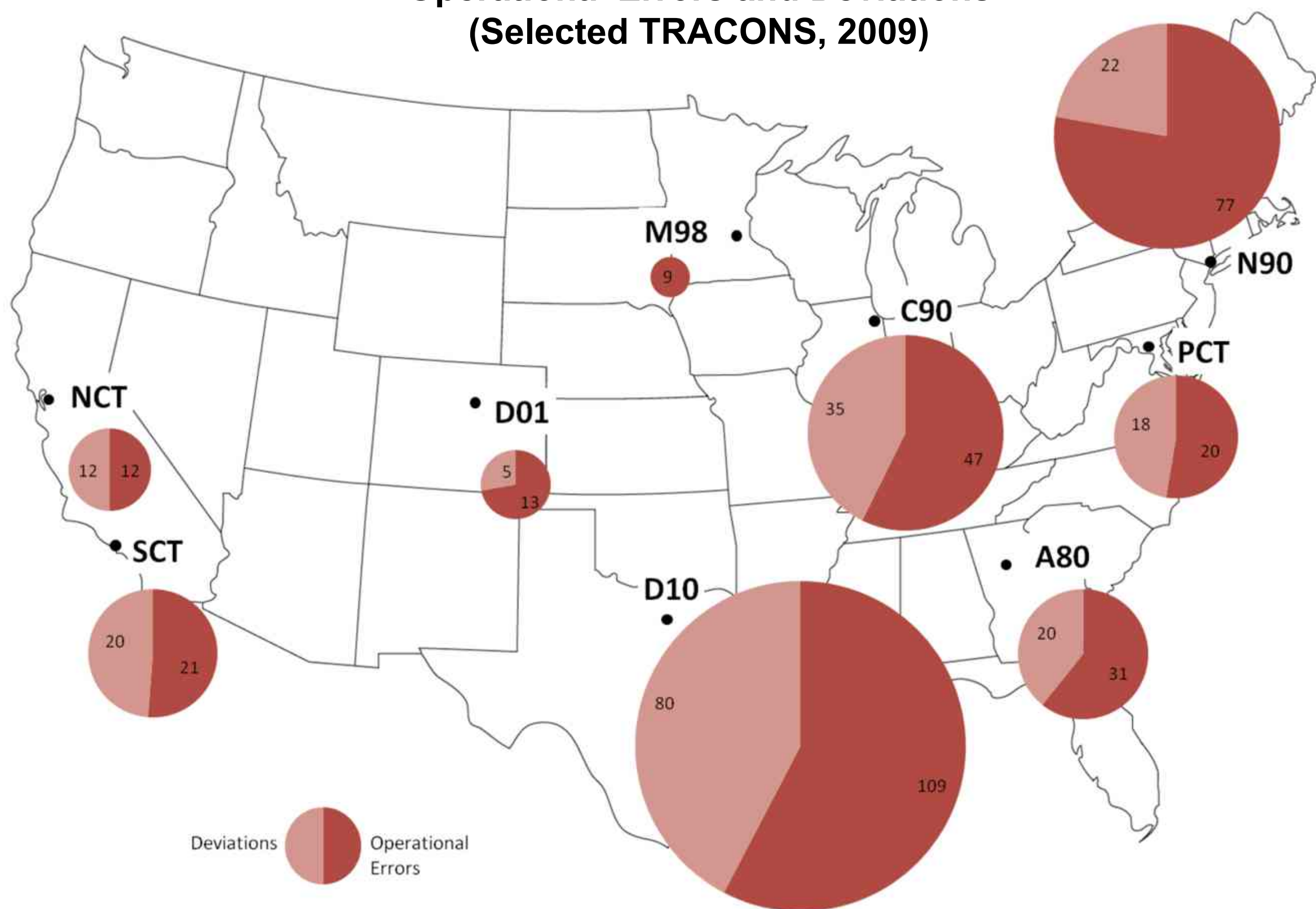




# TERMINAL AREA CONFLICT DETECTION AND RESOLUTION TOOL

Operational Errors and Deviations  
(Selected TRACONS, 2009)



## What is the problem?

FAA data shows a correlation between operational errors and air traffic density. Before air traffic densities dramatically increase, it is important to understand the nature of operational errors and prevent their occurrence.

Currently, the operators of the National Airspace System rely on a conflict detection system called Conflict Alert. It predicts and warns controllers when an aircraft gets into dangerous proximity (much closer than the separation standard) to other aircraft, assuming aircraft maintain their current velocity for some look-ahead period. Conflict Alert is known to produce a large number of false alerts. Development of more reliable systems for terminal airspace is hampered by factors including dense traffic, frequent large-angle turns, and insufficient flight plan data. False alerts are potentially dangerous because they divert controllers' attention from other genuine conflicts that might be occurring elsewhere in the airspace. In addition, when false alerts occur too frequently, controllers may become desensitized to valid alerts.

## What is the solution?

NASA is working, in collaboration with the FAA, to improve the safety of the nation's air transportation system by developing new tools and procedures that are intended to replace Conflict Alert. NASA's solution is a tactical conflict detection and resolution tool specifically designed for the complexities of terminal airspace, called **Terminal Tactical Separation Assured Flight Environment, or Terminal TSAFE**.

Unlike Conflict Alert, Terminal TSAFE calculates trajectories based on the available *flight intent information*. Terminal TSAFE also includes a detailed model of actual separation standards for terminal airspace to define losses of separation. By combining all of these variables, Terminal TSAFE is able to predict the future positions of aircraft and check them for possible conflicts with significantly fewer false alerts.

Analysis of real-world track data of arrival and departure operations at the Dallas/Fort Worth TRACON (Terminal Radar Approach Control) facility from January 2007 to April 2009 showed that while Terminal TSAFE performs similarly to the other algorithms in terms of alert lead time, it shows significant reduction in the number of false alerts. The new Terminal TSAFE algorithm yielded a false alert rate of 2 per hour, representing a 94% improvement over the Conflict Alert model and a 93% improvement over the En Route TSAFE model.

Algorithm Comparison

